



# TDC-100/200 User's Guide





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## Introduction







The Toro TDC-100/200 combines modular flexibility, ease of use and increased programmability in a single controller.

Modularity means flexibility. The TDC-100/200 can control up to 200 stations.

The intuitive user interface is easy to use and includes a backlight for improved visibility in low-light conditions, yet it is completely viewable in direct sunlight. The faceplate's combination of menu keys, navigation arrows and Input Dial allows for easy menu navigation and quick settings establishment.

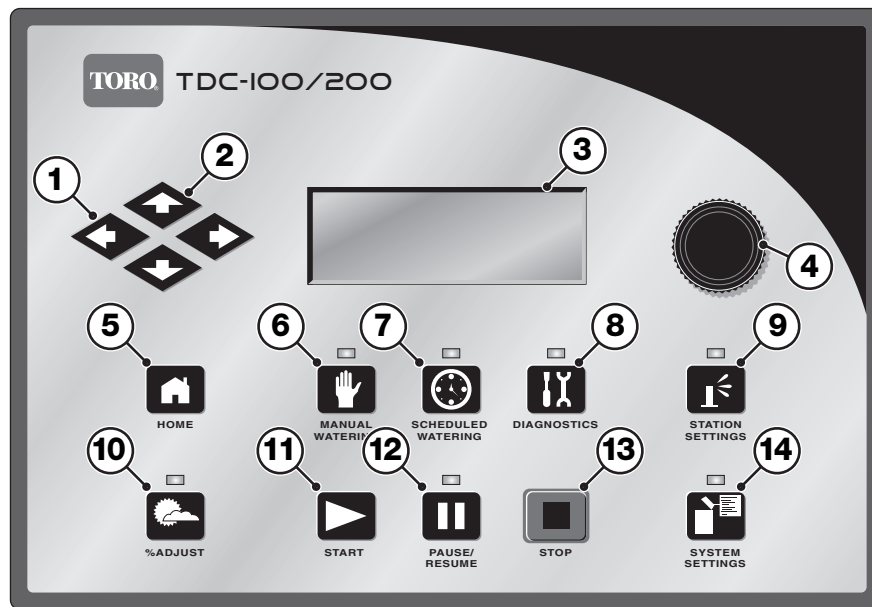
With 10 irrigation programs, the TDC-100/200 allows programming flexibility.

## General Editing

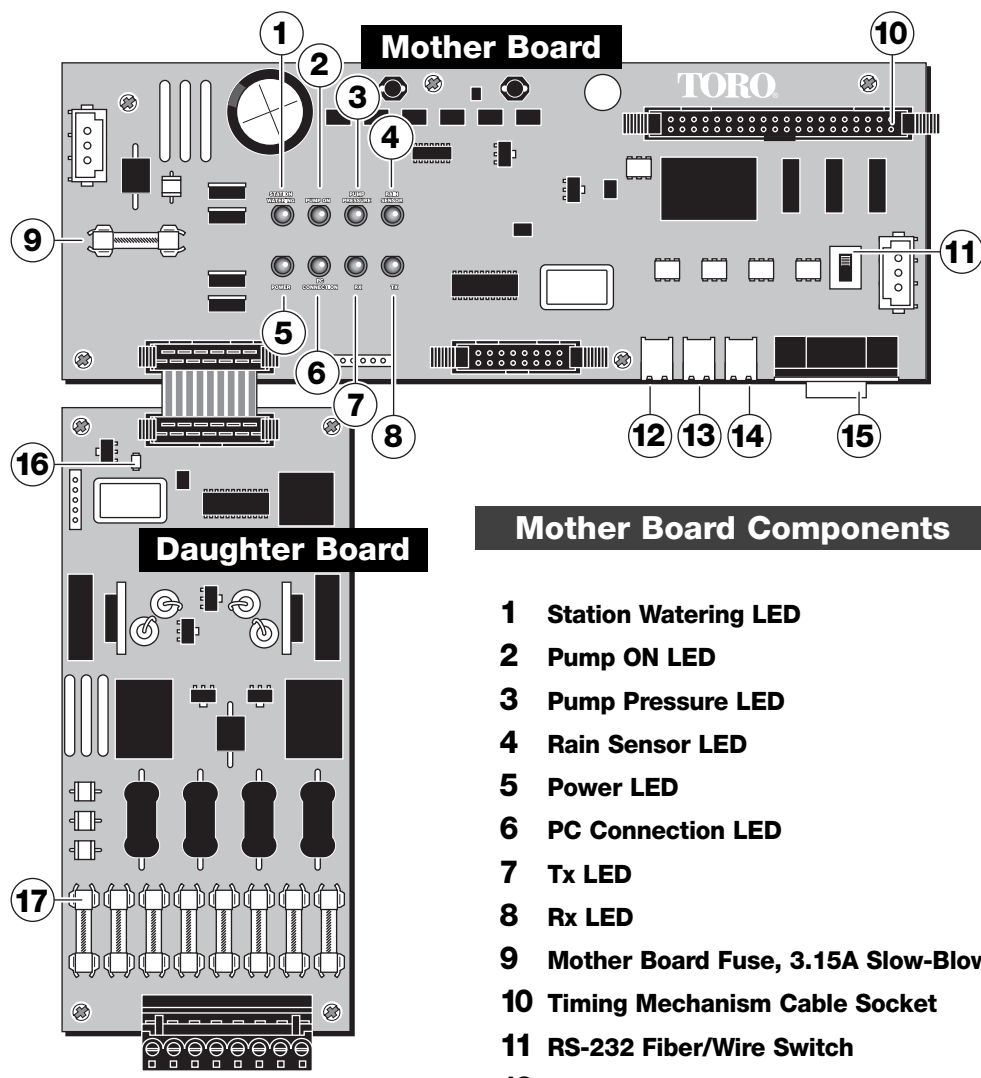
Pressing a menu key on the TDC-100/200 will display menu items. Items with fields containing values that can be edited are called Entry Fields. Use the Arrow Keys     to navigate through the menus and entry fields. Modify any selected value by scrolling through the selection using the Input Dial . Values will be saved automatically when you exit an entry field or press another menu key. Pressing the HOME Key  will also save any modification and revert back to Home display.

Additionally, if no keypad activity is detected within five minutes, the controller will automatically save any modifications and revert back to Home display.

## Timing Mechanism



- 1 **Left and Right Arrows** allow you to select the next entry field within the same menu line. Any changes will be saved after you exit that entry field.
- 2 **Up and Down Arrows** allow you to scroll up and down through the menu items.
- 3 **LCD Panel** is the display screen.
- 4 **Input Dial** allows you to scroll through the value selection within the selected entry field.
- 5 **Home Key** allows you to exit from any function menu and return the controller to normal operation. After pressing the Home Key, all modifications to the settings will be saved.
- 6 **Manual Watering Menu Key** allows you to activate station(s) or program(s) manually.
- 7 **Scheduled Watering Menu Key** allows you to create/modify irrigation programs. Use this function to assign the program type (Standard or Grow- In), watering days, start times, end times, delay times, syringe duration, repeats, soak time, stations, run times and maximum simultaneous stations per program.
- 8 **Diagnostics Menu Key** allows you to run communications test with each decoder and solenoids.
- 9 **Station Settings Menu Key** allows you to modify station parameters. Within this setting, you can set the station number and assign it to a specific decoder, decoder station and path, specify each station's percent adjust, disable the station from any activity by placing a station hold for a specific number of days, set the station type to a switch and create or edit the station description/name.
- 10 **Percent Adjust Menu Key** allows you to adjust watering to a specific percentage range. The user can specify percentage adjustment for the system, programs and stations.
- 11 **Start Key** will execute selected program or manual operation.
- 12 **Pause/Resume Key** will pause currently activated program(s). Press the key while in pause and select Resume to continue operation.
- 13 **Stop Key** will cancel currently running program(s) or station(s).
- 14 **System Settings Menu Key** allows the user to modify the controller parameters. Users can specify the hold duration for controller's activity, set language, time, date, day change, station delay, maximum number of stations to run simultaneously, adjust display contrast and specify sensor type. Within this menu, the user can also reset all programs, reset the station parameters and reset all disables.



**Mother Board Components**

- 1** Station Watering LED
- 2** Pump ON LED
- 3** Pump Pressure LED
- 4** Rain Sensor LED
- 5** Power LED
- 6** PC Connection LED
- 7** Tx LED
- 8** Rx LED
- 9** Mother Board Fuse, 3.15A Slow-Blow
- 10** Timing Mechanism Cable Socket
- 11** RS-232 Fiber/Wire Switch
- 12** Pump Output
- 13** Pump Pressure Input
- 14** Rain Switch Input
- 15** RS-232 Input

**Daughter Board Components**

- 16** Power LED
- 17** Daughter Board Fuse (8), 3.15A Fast-Blow

## Power-Up Diagnostics

Upon power-up, the controller will display:

```
TDC-100/200 System
  Booting
```

The TDC-100/200 will initiate a diagnostic test automatically during power-up. This function will take approximately ten seconds and it can not be bypassed. If a problem is detected during the diagnostic test, it will be indicated on the display.

When completed, information will be displayed momentarily on the screen for five seconds. This status information can not be edited. The information is as follows:

Line 1: TDC-100/200 Firmware Version and Revision Date

Line 2: Detect: [xx stations, yy sensors] (xx = number of stations detected, yy = number of sensors detected)

Line 3: Last Power Downtime Date and Time

Example:

```
Rev: D1.21, 04/25/06
Detect:200sta, 00sen
PD 05/24/06 10:51:20
```

The default Home display will follow after the diagnostic display has timed-out.

Home display example:

```
Mon 08/07/06 10:50am
      Sec: 45
Day Change: 12:00am
```

## Home Key



Pressing the Home Key will revert to the default display. When editing irrigation programs, Station or System settings, pressing the Home Key will save any setting modifications and return the user to the Home display.

Home display example:

```
Mon 08/07/06 10:50am
      Sec: 45
Day Change: 12:00am
```

```
Mon 08/07/06 11:15am
      Sec: 50
Rain ←
Day Change: 12:00am
```

Rain detected indicator for rain sensor equipped Decoder systems

The Day Change line will display the next program start time (**Next Start: HH:MM**) if the current day is an active watering day. If the controller is running a program, the Day Change line will display **Running XX programs** to indicate the number of active programs.

The following example display has two programs running with two stations manually activated, the display will read:

```
Wed 08/09/06 06:50am
      Sec: 32
Running 02 Programs
```

```
P01 Sta01 %00:05:00
P01 Sta02 00:05:00
P01 Sta03D 00:05:00
P02 Sta10P 00:10:00
```

(The “%” symbol before the runtime indicates that station 1 is percent adjusted.)

(P01 indicates Program 01 is currently active)

(The “D” symbol after the station number indicates that station 3 is disabled.)

(The “P” symbol after the station number indicates that program 02 is paused.)

```
Man Sta18S 00:05:00
Man Sta19S 00:10:00
```

(“Man” indicates Manual Watering is currently active)

(The “S” symbol after the station number indicates that program 02 is stacked.)

**Note:** Program stacking occurs when the controller is running a program where the maximum simultaneous station limit is surpassed. Additional scheduled programs will be stacked (delayed) until an available station can be activated.


## System Settings



System Settings allows you to set controller parameters such as Time, Date and Language.

Use the Up or Down Arrows   to navigate through the menus.

Use the Left and Right Arrow   to advance to the next entry field on the same menu line.

Use the Input Dial  to select values when editing.

**Language:** – Default, English. Future option, Spanish, French, German and Italian.

**Clock Set:** – Use this function to set the current time.

**Clock Mode:** – Use this function to select the clock mode between Am/Pm (12-Hour) and 24-Hour mode.

**Date:** – Use this function to set the current date.

**Day Change:** – Use this function to set the “day change” time. The “day change” is the specified time that the controller will advance the date. The default day change is 12:00 am. Adjusting the day change time will allow programs to start throughout the night on the same active day schedule. Programs with runtimes beyond the day change time **are** allowed to finish.

**System Mode:** – Use this function to toggle between Golf and Commercial modes.


**LP Shutdown:** – The TDC system can be equipped with a low pressure system to detect system failure. Use this function to set the wait time until the controller reevaluates the low pressure condition before shutting the whole system down. This delay will eliminate system shutdown when pressure intermittently fluctuates.

**Sta Delay:** – Use this function to set the controller’s station delay. The station delay determines the wait time before next station is activated when a station has concluded its watering cycle. This delay is used to allow the system to normalize between station activations.

**Max Sim Sta:** – Use this function to set the maximum number of simultaneously operating stations. This threshold will be applied to all programs and manual irrigation functions. Each program can then be set with a lower limitation if necessary.

Example: The controller is set with a maximum simultaneous active stations of **7**. All programs in the controller will adhere to the 7 maximum active stations and each can be adjusted with a lower limit (6, 5, 4, etc.).

**Units:** – Use this function to change the controller units between English (U.S. Standard) and Metric units.

**Display Adj:** – Use this function to adjust the contrast of the LCD screen. Use the Input Dial  to darken or lighten the text display.

**Sensor:** – (For future use.)





**Hold For:** – Use this function to suspend controller operation and choose the suspension duration from Today, 02-30 days, Permanent or None.

**Reset Prg's:** – Use this function to reset all controller irrigation program by selecting Yes. After selecting Yes, press the Up or Down Arrows   to activate. The following will display:



```
Reset All Programs
to defaults
  05
STOP to escape
```

All program data will be erased after a successful reset.

**Reset Sta's:** – Use this function to reset all station settings by selecting Yes. After selecting Yes, press the Up or Down Arrows   to activate. The following will display:

```
Reset All Stations
to defaults
  05
STOP to escape
```



All station settings will be erased after a successful reset.

**Reset Unit:** – Use this function to reset the controller settings by selecting Yes. After selecting Yes, press the Up or Down Arrows   to activate. The following will display:

```
Reset All Defaults
  10
STOP to escape
```

After the 10-second countdown, the controller will reboot.

Resetting the unit will erase all user-defined program data and configuration values in the controller's memory.

**Reset Disab :** – Use this function to reset all stations that are disabled by selecting Yes to the selection. After selecting Yes, press the Up or Down Arrows   to activate. The following will display:

```
Reset Sta Disables
  10
STOP to escape
```

## Station Settings

 Station Settings allows you to set parameters specific to each station.

Use the Up or Down Arrows   to navigate through the menus.

Use the Left and Right Arrow Keys   to advance to the next entry field on the same menu line.

Use the Input Dial -  + to select values when editing.

**S01** – Select the station you want to edit in this field. Choose from Station 01 through the controller maximum station count of 200.

```
S100 100% 1STSTLAWN
Decoder Addr: 38684
Dec Sta: 4 Path: 2
Disable: No
```

**100%** – If weather or other condition requires irrigation program modification, it can be easily adjusted by changing the percent adjustment. Station operation can be reduced to 000% (Off) or increased up to 900%. 100% represents standard operation.

```
Set Sta as a MV: NO
Assn Sta to MV: 000
Sched today: NONE
Water today: NONE
```

**Decoder Addr:** – Enter the decoder's 5-digit address code that corresponds to the selected station.

**DecSta:** – If using a 2 or 4-station decoder, select the decoder station to designate to the selected station.

### Decoder Station Color Codes

RED = Station 1, GREEN = Station 2, ORANGE = Station 3,  
BLUE = Station 4

```
Is Switch: NO
Hold Sta : NO
Cycles : 01 times
Edit Name: 01TE020
```

**Path:** – Select the correct wire path (1 or 2). Enter wire path 01 for stations connected to the 1st daughter board and wire path 2 for the 2nd daughter board.

```
FlowSens:03StaFlo200
Output Volts: 15
```

**Disable:** – Use this function to disable station operation by selecting **Yes** from the menu. Resume station operation by selecting **No** from the menu.

**Set Sta as a MV:** – Use this function to designate the station to operate as a Master valve (up to 6) by selecting **Yes**.

**Suggestion:** Assign station number that will not interfere with your programming such as 100 or 200.

**Assn Sta to MV:** – Use this function to assign a station to run with a specific master valve (Not available if the station is designated as a Master Valve).

**Sched Today:** – This function will display the total scheduled station runtime for the current day.

**Water Today:** – This function will display the total station runtime that has occurred for the current day.

**Is Switch:** – Use this function to assign the selected station to a switch. When the switch (station) is activated, the Master Valve or Pump will not actuate.

**Hold Sta:** – Use this function to delay operation for this station. Select the hold duration from 01–30 days, Permanent or None. This function is useful when a specific station needs to be deactivated without affecting any of the programs.

**Cycles:** – (For Future Use)

**Edit Name:** – Use this function to assign a name description to the station. In Golf mode, the naming format is XX-AA-YYY, where XX represents the golf course hole number, AA represents the area description acronym and YYY represents the sprinkler number within the area. By following the naming format, you can easily figure out where and what area the station is watering.

### Area Description Acronym Listing

**GR** = Greens **DR** = Driving Range **TE** = Tee **CL** = Club House **FW** = Fairways  
**LA** = Landscape **RF** = Rough **PG** = Putting Green **AP** = Approaches **MS** = Misc.


In Commercial mode, assign a 10-character name of your choice, such as "shrubs" or "back lawn".

**Flow Sens:** – (For future use.)

**Output Volts:** – Use this function to select the controller's output voltage. Select between 15 or 20 volts DC.

**Important!** For proper operation, install compatible DC-latching solenoids only.

## Scheduled Watering


















 The TDC-100/200 features 10 fully-independent resident programs. With two types of programs to select from, you can further custom fit your irrigation programs to any landscape.

- **Standard Irrigation Program** will activate a station or group of stations with six start times on a daily basis. Each station will water for the duration specified in hours, minutes and seconds. Percent adjust and maximum number of simultaneous activate stations per program can be specified in this program.
- **Grow-In Irrigation Program** will activate a station or group of stations for the length of their runtime. The program will repeat the cycle after the specified delay time expires and will repeat continuously between the set Start and End times. Percent adjust and the simultaneous activate stations can be specified in this program.



















To utilize these programs automatically or manually, each program must be configured.

### Standard Irrigation Program Setting:

Standard Irrigation Program example: Create Program 02 with stations 6–10 running 15 minutes each and stations 15–20 running 10 minutes each with no percent adjustments. Set the start time at 6:30 am with five maximum simultaneous active station.

1. Press the Scheduled Watering Key . The cursor is initially located at the program selection field. Use the Input Dial -  + to select the program (P01–P10) you want to create or modify. For this example, select **2**.
2. Press the Right Arrow Key  to standard to the Percent Adjust field. Normally this setting will be 100% unless weather or other condition suggest that less or more irrigation is needed. Use the Input Dial -  + to adjust the setting. For this example, no adjustment is needed.
3. Press the Down Arrow  to advance the cursor to the **Hold:** field. Use this function to suspend program operation. Select from **None**, **Today**, **02–30** days or **Permanent**. For this example, select **None**.
4. Press the Down Arrow  to advance the cursor to the **Type:** field. Use the Input Dial -  + to adjust the setting. For this example, set the Type to **Standard**.
5. Press the Down Arrow  to advance the cursor to the **Days:** field. Use the Input Dial -  + to select the program activation interval from 01–30 days. Select 01 for everyday, 02 for every other day, 03 for every third day and so on. The example does not call for a set interval. Leave the **Days:** setting to **SMTWTFS...**
6. Press the Down Arrow  to advance the cursor to the **Set:** field. Use the Input Dial -  + to select from any of the preset intervals (All, Alternate days, Weekdays only, Weekends only, None or User set). To create your own program activation interval, select **Set:**. Use the Right Arrow Key  to select the day of the week you want to irrigate and use the Input Dial -  + to activate (X) or deactivate (blank) the selection. For this example, activate M (monday), W (wednesday) and F (friday) only. MWF of the 1st and 2nd week should have an **X** mark under while the rest are blank.
7. Press the Down Arrow  to advance the cursor to the **Start:** field. The first entry field will indicate the start time number. Each program can have a maximum of 24 start times. Use the Input Dial -  + to choose the start time being created or modified. Press the Right Arrow Key  to advance to the time entry field. Use the Input Dial -  + to select the start time in hours and minutes ( HH:MM). Repeat Step 7 for additional start times. For this example, set start time **01** to **05:45am**.

(Continued to the next page)

8. Press the Down Arrow  to advance the cursor to the **Sta Dly:** field. Use the Left and Right Arrow Keys   to navigate between the Hour and Minute fields. Use Input Dial  to set the Station Delay duration. Station delay is the wait period when a station finished watering and when the next station is activated. In most situations, station delay is used to allow slow -shutting valves time to fully close before activating another station and also to allow the water source, such as a well, to recover. For this example, set Station Delay to remain at **00**.
  9. Press the Down Arrow  to advance the cursor to the **Syringe:** field. Use the Input Dial  to set the Syringe duration. When a syringe duration (0–99 minutes) is set, an asterisk is placed in front of the start time number to indicate that this start time is a syringe start. During a syringe, the stations will all activate for the syringe duration regardless of their assigned runtimes. For this example, do not set a Syringe duration.
  10. Press the Down Arrow  to advance the cursor to the **Repeats#:** field. Use the Input Dial  to enter the number of times the program will repeat the cycle. For this example, set Repeat to remain at **00**.
  11. Press the Down Arrow  to advance the cursor to the **Soak#:** field. Use the Input Dial  to enter the soak duration before the station is reactivated. For this example, set a soak duration of **00:10:00**.
  12. Press the Down Arrow  to advance the cursor to the **Sta#:** field. Use the Input Dial  to select the first station being irrigated in the sequence. For this example, select station **06**.
  13. Press the Right Arrow  to advance the cursor to the next value. This value will indicate the last station in the sequence. If irrigating only one station, this value will be the same as the first value. For this example, select station **10**. With 6 being the first station and 10 being the last station, the program schedule will water stations 6, 7, 8, 9 and 10 in sequentially.
  14. Press the Right Arrow  to advance the cursor to the next entry field. This entry field will indicate the runtime in hours, minutes and seconds ( HH:MM:SS). Use the Input Dial  and the Right Arrow Key  to select the appropriate runtime value. For this example, set the value to **00:15**.
- Repeat Steps 8–10 to assign stations 10–20 with a runtime of 10 minutes.
15. Press the Down Arrow  to advance the cursor to the **Simult:** field. Use the Input Dial  to select the maximum allowable simultaneous active station. For this example, set the value to **05**.

**Note:** The Program's Simultaneous setting is limited to the System's Simultaneous value.

When finished, the display should read:

```
P02 100% 01:15:00
Hold: None
Type: Standard
```




























```
Days: SMTWTFSSMTWTFSS
set>:
Start : 01 05:45am
Sta Dly: 00:00 (h:m)
```

```
Syringe: 00 min
Repeats: 00
Soak: 00:10:00
Sta#: 06-10 00:15
```

```
Sta#: 15-20 00:10-
Sta#: ----- --:--
Simult: 05
```

### Grow In Irrigation Program Setting:

Grow In Irrigation Program example: Create program 3 with stations 21–30 for 5 minutes each with no percent adjustment. Set the start time at 6:30 am and the end time at 4:00 pm. Set the delay for 2 hours and 15 minutes and the maximum simultaneous active station to 5.

1. Press the Scheduled Watering Key . The cursor is initially located at the program selection field. Use the Input Dial -  + to select the program (P01–P10) you want to create or modify. For this example, select program **3**.
2. Press the Right Arrow Key  to advance to the Percent Adjust field. Normally this setting will be 100% unless weather or other condition suggest that less or more irrigation is needed. Use the Input Dial -  + to adjust the setting. For this example, no adjustment is needed.
3. Press the Down Arrow  to advance the cursor to the **Hold:** field. Use this function to suspend program operation. Select from **None**, **Today**, **02–30 days** or **Permanent**. For this example, select **None**.
4. Press the Down Arrow  to advance the cursor to the **Type:** field. Use the Input Dial -  + to adjust the setting. For this example, set the Type to **Grow-In**.
5. Press the Down Arrow  to advance the cursor to the **Start:** field. This start time will indicate the starting point of the Grow-In cycle. Use the Input Dial -  + to select the start time value. Use the Left and Right Arrow Keys   to navigate between the Hours and Minutes fields. For this example, set the start time to **06:30am**.
6. Press the Down Arrow  to advance the cursor to the **End:** field. This end time will indicate the end point of the Grow-In cycle. Use the Input Dial -  + to select the end time value. Use the Left and Right Arrow Keys   to navigate between the Hours and Minutes fields. For this example, set the end time to **04:00pm**.
7. Press the Down Arrow  to advance the cursor to the **Delay:** field. This delay time will determine the wait time between program cycles. Use the Input Dial -  + to select the delay time value. Use the Left and Right Arrow Keys   to navigate between the Hours and Minutes fields. For this example, set the delay time to **02:15**.
8. Press the Down Arrow  to advance the cursor to the **Sta#:** field. Use the Input Dial -  + to select the correct value of the first station being irrigated. For this example, select station **21**.
9. Press the Right Arrow  to advance the cursor to the next value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. For this example, select station **30**.
10. Press the Right Arrow  to advance the cursor to the next entry field. This entry field will indicate the runtime in hours, minutes and seconds (HH:MM:SS). Use the Input Dial -  + and the Right Arrow Key  to select the appropriate runtime value. For this example, set the runtime to **00:05**.
11. Press the Down Arrow  to advance the cursor to the **Simult:** field. Use the Input Dial -  + to select the maximum allowable simultaneous active station. For this example, set the value to **05**.

When finished, the display should read:

```
P03 100% 00:50:00
Hold: None
Type: Grow In
Start: 06:30am
```

```
End: 04:00pm
Delay: 02:15<hr:min>
Sta#: 21-30 00:05
```

```
Sta#: -----:---:---
Simult: 05
```

## Manual Watering



The Manual Watering functions are used for additional watering if the irrigation program is not sufficient. They can also be used to troubleshoot each station for proper operation. Pressing the Manual Watering Key will access three manual irrigation functions; Multi-Manual, Syringe and Program.

**M-Manual** - Select M-Manual to activate a station or group of stations with a specified runtime.

### Multi-Manual Station Activation Directions

Manual station activation example: Activate stations 1–12 with a runtime of 5 minutes each and limit watering to 3 stations simultaneously.

**Note:** The Multi-Manual function is limited to the maximum simultaneous station settings of the controller. In cases where a program is running and a multi-manual activated, the controller will activate all stations specified in the multi-manual in addition to the currently activated stations. Thus, the multi-manual will allow the controller to exceed the maximum simultaneous station settings.

1. Press the Manual Watering Key .
2. The cursor should be located in the Manual field, use the Input Dial - + to select **M-Manual**.
3. Press the Down Arrow to advance the cursor to the **Sta#:** field. Use the Input Dial - + to select the correct value of the first station being irrigated. For this example, select station **01**.
4. Press the Right Arrow to advance the cursor to the next value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. For this example, select station **12**.
5. Press the Right Arrow to advance the cursor to the next entry field. This entry field will indicate the runtime in hours, minutes and seconds (HH:MM:SS). Use the Input Dial - + and the Right Arrow Key to select the appropriate runtime value. For this example, set the value to **00:05**.
6. Press the Down Arrow to advance the cursor to the next entry field. Notice that a new Station: line was created. Fill this line only if irrigating multiple ranges of stations, otherwise, leave this line blank.
7. Press the Down Arrow to advance the cursor to the **Simult:** field. Use the Input Dial - + to select the maximum simultaneous irrigating stations. For this example, set the value to **03**.
8. Once finished, press the Start Key to activate or press the Home Key to cancel and revert back to the default display.

**Note:** Pressing the Home Key will save the entered values.

When finished, the display should read:

```
Manual: M-Manual
Sta#: 01-12 00:05
Sta#: ----- --:--
Simult: 03
```

```
Press START to water
```












**Syringe** - Choose Syringe to activate all the stations in a selected irrigation program for a specified runtime.

**Note:** The Maximum number of simultaneous stations set in the program still applies.

### Manual Syringe Activation Directions

Syringe activation example: Manually activate all the stations in Program 3 for 2 minutes each.

**Note:** An irrigation program must be configured to activate Manual Syringe.

1. Press the Manual Watering Key .
  2. The cursor should be located in the Manual field. Use the Input Dial   to select **Syringe**.
  3. Press the Down Arrow  to advance the cursor to the **Runtime:** field. Use the Input Dial   to select the correct value of the runtime in minutes. For this example, set the value to **02** minutes.
- Note:** The Runtime setting in Syringe will not affect the actual runtime in the program.
4. Press the Down Arrow  to advance the cursor to the **Program:** field. Use the Input Dial   to select the correct program to syringe. For this example, select program **03**.
  5. Once finished, press the Start Key  to activate or press the Home Key  to cancel and revert back to the default display.

**Note:** Pressing the Home Key will save the entered values.

When finished, the display should read:









```
Manual: Syringe
Runtime: 02 min
Program: 03
Press START to water
```

**Start Program** - Select Start Prog to activate a watering program regardless of its set start time.

### Manual Program Activation Directions

Start Program example: Manually activate Program 08.

**Note:** An irrigation program must be configured to activate Manual Program. A program on hold can still be manually activated.


1. Press the Manual Watering Key .
2. The cursor should be located in the Manual field. Use the Input Dial   to select **Start Prog**.
3. Press the Down Arrow  to advance the cursor to the **Program:** field. Use the Input Dial   to select the correct program value. For this example, select program **08**.
4. Once finished, press the Start Key  to activate or press the Home Key  to cancel and revert back to the default display.

**Note:** Pressing the Home Key will save the entered values.

When finished, the display should read:

```
Manual: Start Prog
Program: 08
Press START to water
```











## % (Percent) Adjust

 The percent adjust function allows you to fine tune irrigation programs. With weather conditions changing constantly, Percent Adjust allows you to tune your system easily without changing all the values in the program. Important: The settings do not override each other, instead, they multiple each other to get the effective adjustment.


Example: Controller is set at 150%, Program is set at 125% and Station is set at 90%. The effective watering adjustment is calculated to be  $1.5 \times 1.25 \times 0.9 = 1.68$  or 168%.

Percent Adjust...	
Global: 100%	← Global will adjust from 1–250%
Program : P01 100%	← Program will adjust from 10–250%
Station : S01 100%	← Station will adjust from 0–250%

### % Adjust Directions

1. Press the % Adjust Key . The cursor is initially located at the System % Adjust field. Use the Input Dial  to adjust the controller watering up to 900% or down to 1%.  
**Note:** The controller adjustment will affect all stations and programs universally. Do not adjust the System % settings if adjustment is station or program specific.
2. Press the Down Arrow  to advance the cursor to the **Program:** field. The first entry field will be the program selection field. Use the Input Dial  to select the program being adjusted. Press the Right Arrow  to advance the percent adjustment field. Use the Input Dial  to adjust the program watering up to 250% or down to 10%. Repeat step 2 to adjust additional programs.  
**Note:** Do not adjust the program % setting if adjustment is station specific.
3. Press the Down Arrow  to advance the cursor to the **Station:** field. The first entry field will be the station selection field. Use the Input Dial  to select the station being adjusted. Press the Right Arrow  to advance to the percent adjustment field. Use the Input Dial  to adjust the station watering up to 900% or down to 000%. Repeat step 3 to adjust additional stations.  
**Note:** Adjusting the station's watering to 000% will prevent it from running within a program. Multi-Manual and Syringe are not affected by the % Adjustment.

## Start Key

 The Start key is used to execute a manual function.

**Note:** Pressing the Start key while the controller is idle will prompt the Manual Watering menu.

Multi-Manual Start Display

```
Multi-Manual
Starting
  03
STOP to cancel
```


Manual Syringe Start Display

```
Syringe Starting
Program 01
  03
STOP to cancel
```

Manual Start Program Display









## Pause / Resume Key

 The Pause command is used to suspend active program or manual irrigation. The Pause function allows the user to specify the pause duration.

### Pause / Resume Function Directions


Pause function example: Program 01 has been manually activated. Pause program 01 for 30 minutes.

1. Press the Pause  key.
2. Use the Input Dial -  + to select All, M-Man or Prg:XX (XX = the program number). If multiple programs are active, use the Right Arrow key  to tab to the program number field before using the Input Dial to select the correct program number. For this example, select **Prg: 01**.
3. Press the Down Arrow  to advance the cursor to the **for:** field. Use the Input Dial -  + and the Right Arrow key  to select the pause duration in hours and minutes. For this example, set the pause duration to **00 hr 30 min**.



The display should read:

```
Pause: Prg: 01
for: 00hr 30 min
Press PAUSE to pause
00 Programs Paused
```

**Note:** The default pause time is **00 hr 05 min** minutes.


4. Press the Pause  key to initiate the Pause function.

Resume Controller Activity example: Reactivate Program 01 watering.

1. Press the Pause  key.
2. Use the Input Dial -  + until the correct program or multi-manual operation is displayed. For this example, select **Resume: Prg: 01**.

The display should read:

```
Resume: Prg: 01
Press PAUSE to pause
01 Programs Paused
```


3. Press the Pause  key to release the Pause function.

## Pause Function

## TDC-100/200 Action



Pause Program XX	Allow the start of other programs, multi-manuals and syringe. If the start time of the paused program occur's again while still on Pause, that runtime will be stacked (delayed until the first occurrence is completed). If Program XX is already on Pause or Pause All is in effect, the new pause time-out will override the remaining pause time for program XX.
Pause Multi-Manual	Allows any program or syringe start. If a new multi-manual is activated, the previous will be canceled. If Multi-Manual is already on Pause or Pause All is in effect, the new pause time-out will override the remaining pause time for the multi-manual.
Pause Syringe	Allows any program or manual start. If a new syringe is activated for the same paused syringed program, the pause will be cancelled and activity will resume with the new runtime. If a syringed program is on Pause All, activating a new pause for the same syringe program will overwrite the remaining pause time with the new pause time for that syringed program.
Pause All	All currently running programs, multi-manual and syringe will be suspended until the pause time-out expires. New start is allowed only for Manual functions. Additional programs that are scheduled to start while Pause All is in effect will be stacked until the Pause time-out expires.
Pause All Timed out	All activity delayed by Pause All function will resume. Programs and Manual functions that were paused after the Pause All function will resume when their pause time-out expires.
Resume Program XX	Resumes program XX activity.
Resume Multi-Manual	Resumes multi-manual activity.
Resume Syringe	Resumes syringe activity.
Resume All	Resumes all irrigation activity.
Cancel (Stop) Program XX	If Program XX is paused, the pause status will be cancelled and activity terminated. If the same program is stacked, it will also be terminated.
Cancel (Stop) Manual	If Manual activity is paused, the pause status will be cancelled and the manual activity is terminated.
Cancel (Stop) All	All paused activities will be cancelled and all watering will be terminated.

## Stop Key

 Use the Stop function to cancel program or manual irrigation. If the controller has no current activity, pressing the Stop key will have no effect.


### Stop Function Directions

Stop Function Example: Program 01 is activated automatically. Cancel watering for program 01.

1. Press the Stop  key.
2. Use the Input Dial  until the desired program or station to be cancelled is displayed.  
For this example, select **Cancel: Prg: 01**.

The display should read:

```
Cancel: Prg:01
STOP to cancel water
Running 01 programs
P01 is running
```

3. Press the Stop  key to finalize the program cancelation.

When finished, the display should read:

```
Cancelling P01
03
STOP to escape
```

# Diagnosics

**IX** The diagnostics function allows the user to monitor Radio Link status, check the firmware version, troubleshoot stations using the Sequence Stations options, monitor the system's water usage, monitor all system's sensor status, monitor system's voltages, check alarm status, clear alarms and execute a self diagnostics to the system.

```
Menu: Station Alarms
No Station Alarms
```

← Use this menu to check alarm codes that have been activated. Use the codes to troubleshoot for possible errors and faults.

```
Menu: Clear Alarms
Last code: 04
08/21/06, 13:21:09
```

← Use this menu to clear alarm codes once it's been restored.

```
Menu: RunDiagnostics
Press START to start
```

← Use this menu to run the system's self diagnostic to troubleshoot the system.

```
Menu: Revision
Revision: 02.00
Rev. Date 08/10/06
```



← Use this menu to verify firmware version.

```
Menu: Seq Stations
On each for: 30 sec
Press START to start
```

← Use this menu to troubleshoot the system by sequencing through all the stations for 5 sec, 30 sec, 1 min, 2 min or 5 min.

```
Menu: Water Use
No available
Information
```

← Use this menu to monitor the system's water usage. You can use this information to adjust your system as necessary.

While the controller is in the station sequence process, you can navigate to the next station or previous station by using the Right or Left arrows  .

```
Menu: Sensor Monitor
No available
Information
```

← Use this menu to monitor sensors. Flow, pressure and alarm sensor information will be displayed here.

```
Menu: VA Monitor
Battery Volt: 3.3
LCD Voltage: 2.7
```

← Use this menu to monitor the system's voltages.

## Sample Alarm Display During Normal Operation:

```
Sun 05/17/06 11:04am
Chk Alarms Sec: 36
Next start: 07:00pm
```

← TDC indicates Check Alarms Status when a fault is detected within the system.

```
Press DOWN to list
05/17/06, 11:05
Station OPEN
No comm w/ decoder
```

← Station Alarms will list any detected system faults with descriptions for quick and easy system troubleshooting.

## Fuse & Circuit Breaker Specifications

### Power Supply:

1.5A On/Off Switch/Circuit Breaker – Main Power Input

3.15A Fuse (Slow-Blow) – Field Output

**Mother Board:** 3.15A Fuse

## Controller Specifications

**Line Voltage:** 100, 220 or 240 VAC 50/60 Hz, 98 VA

**Current Draw (no load):** 0.21A @ 100-120 VAC, 60 Hz or 0.10A @ 200-240 VAC, 50 Hz

**Current Draw (maximum load):** 0.91A @ 100-120 VAC, 60 Hz or 0.45A @ 200-240 VAC, 50 Hz

**Current Load:** 28 VAC

Maximum Current Available for Load: 3.15A (90 VA)

Maximum Load Per Station: 0.0036A (0.01 VA)

**Operating Temperature:** -10°C to +60°C (14°F to 140°F)

**Storage Temperature:** -30°C to +65°C (-22°F to 149°F)

## Electromagnetic Compatibility

### Radio complies with FCC Part 22 and Part 90 of the FCC Rules

**Domestic:** This equipment has been tested and found to comply with the limits for a FCC Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to the radio communications. Operation in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.